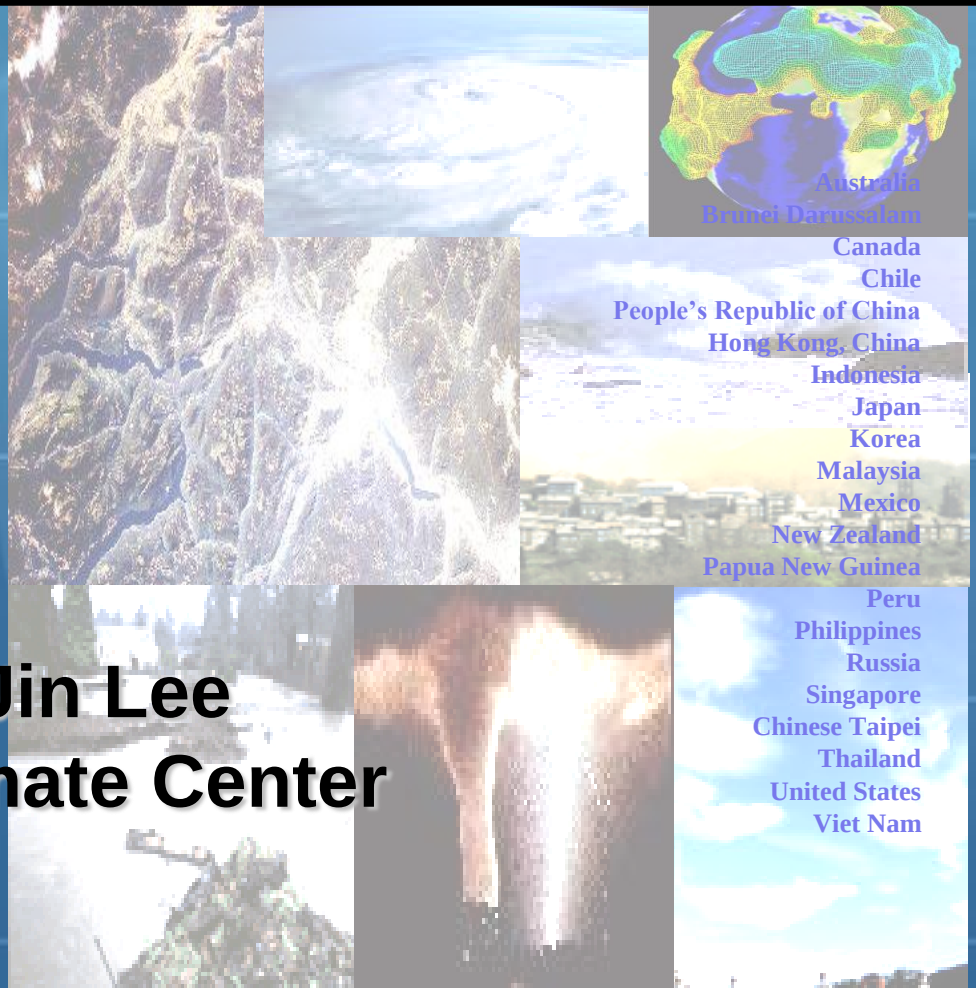
# AREA OF INTEREST

## Panel Discussion
## Workshop on High-Resolution Climate Modelling
## (10-14 August 2009)

Asia
Pacific
Economic Cooperation
Climate
Center



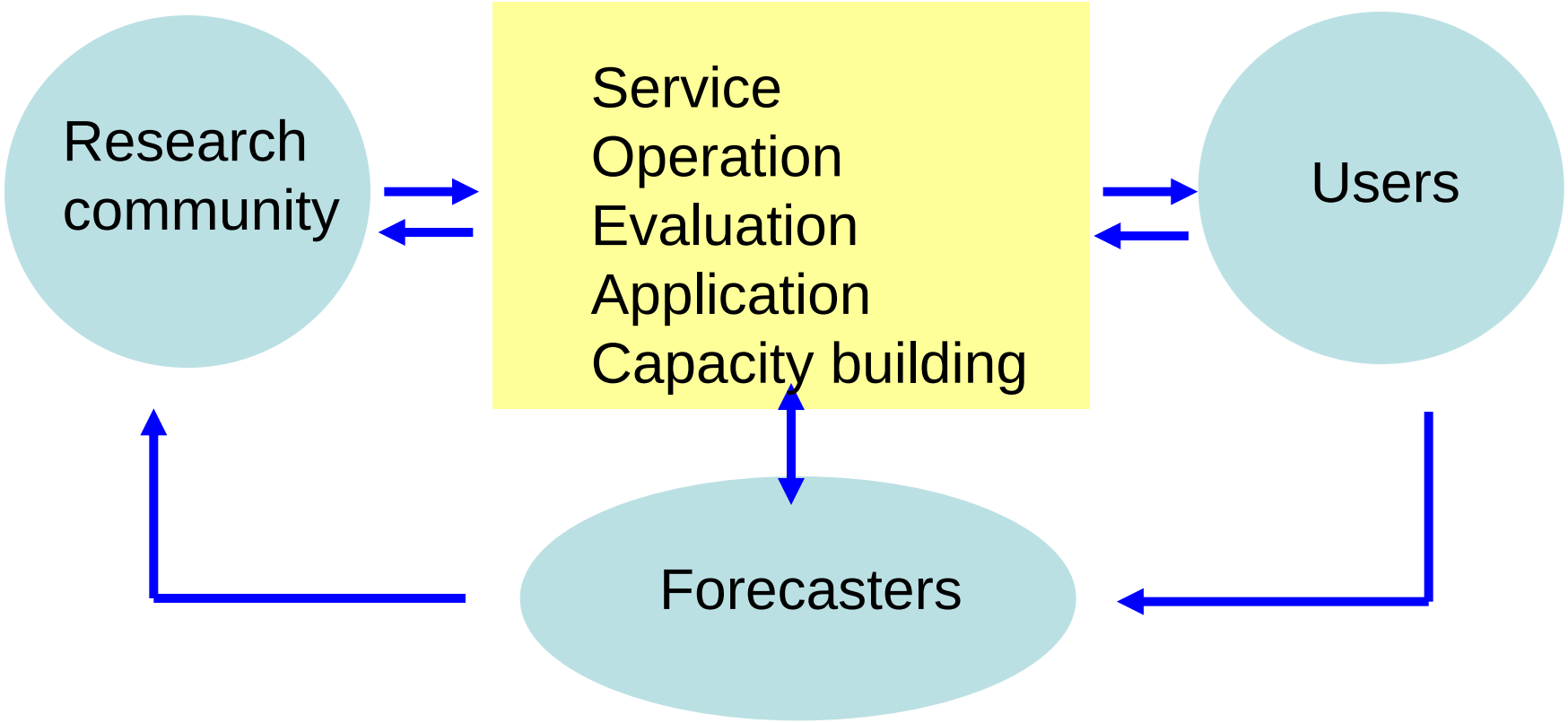

**Woo-Jin Lee**
**APEC Climate Center**

# Contents

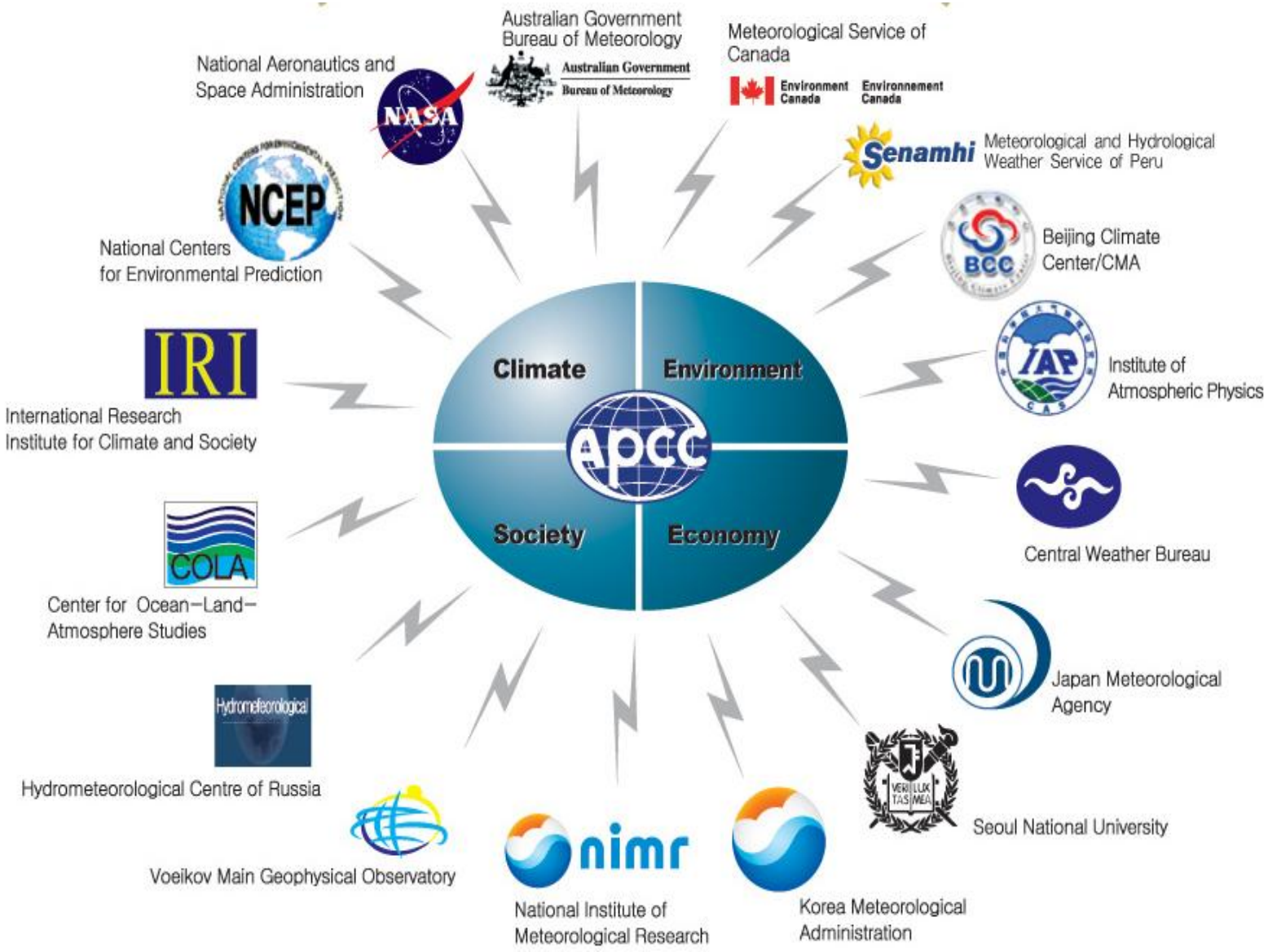
- Introduction to APCC
- Area of interest
  - Model diagnostics
  - Testbed on extreme climate prediction
  - Data and information sharing
  - Others

# Science and User Benefit

**INNOVATION** **?** **SOCIAL BENEFIT**

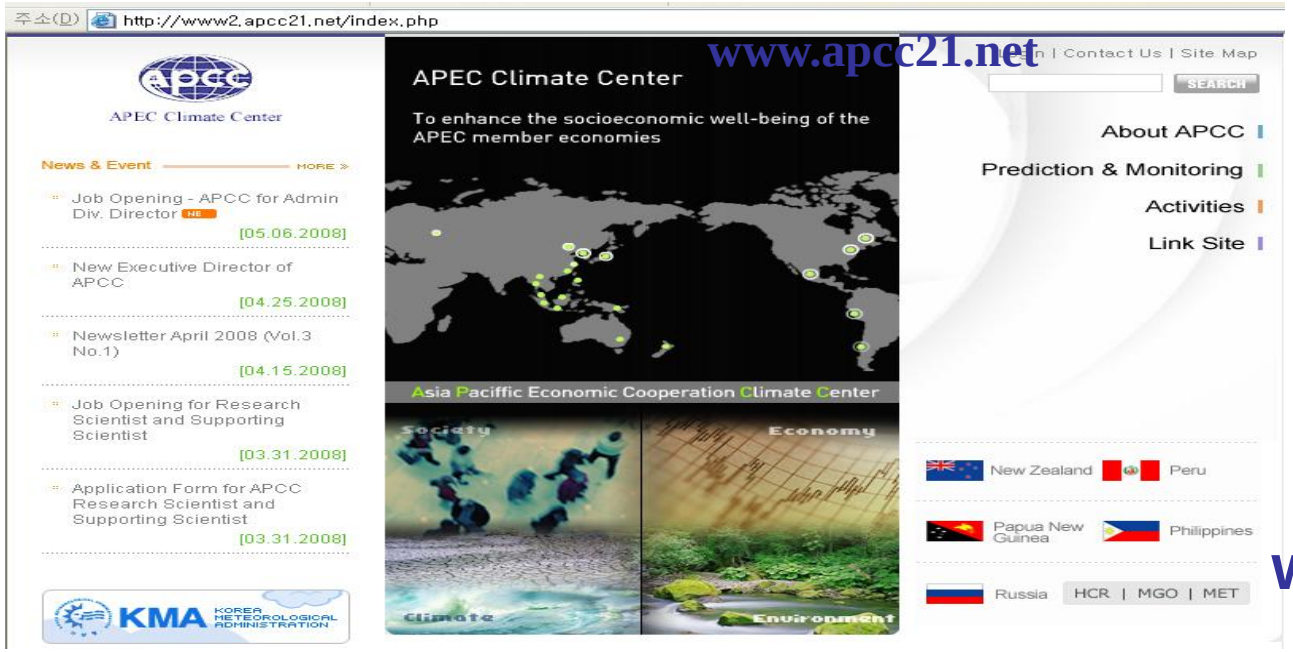


# Multi-Institutional Cooperation



# Operation and Service Schedule

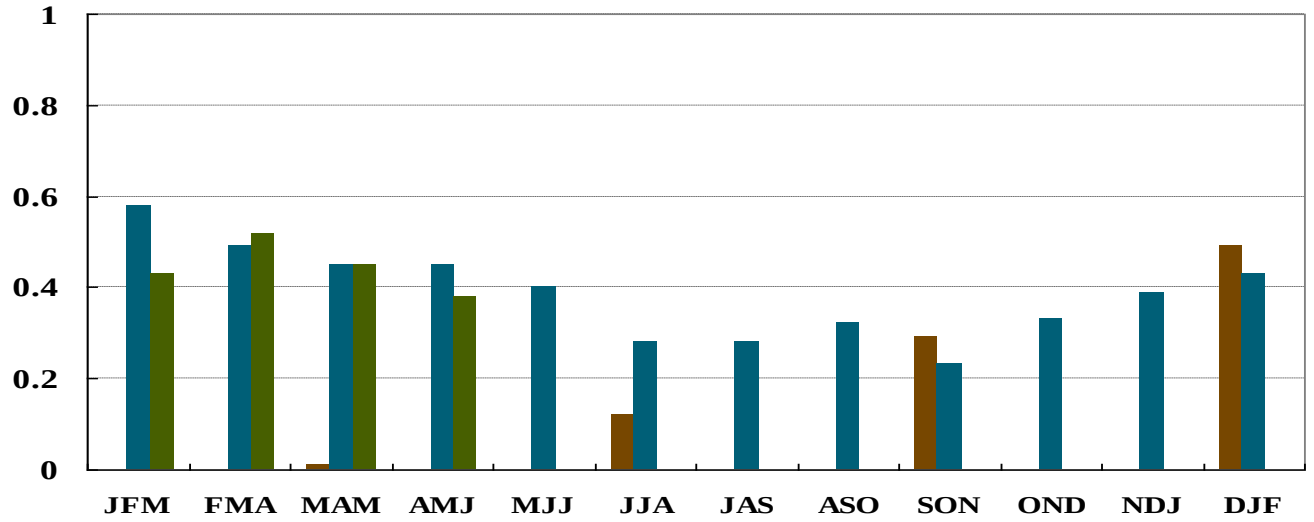
| The day in the month before the season | 1~10 | 11~15 | 16~21 | 22~23 |
|---|---|---|---|---|
| Mission | data collection | Standardization & quality check | MME production | Outlook & upload to website |



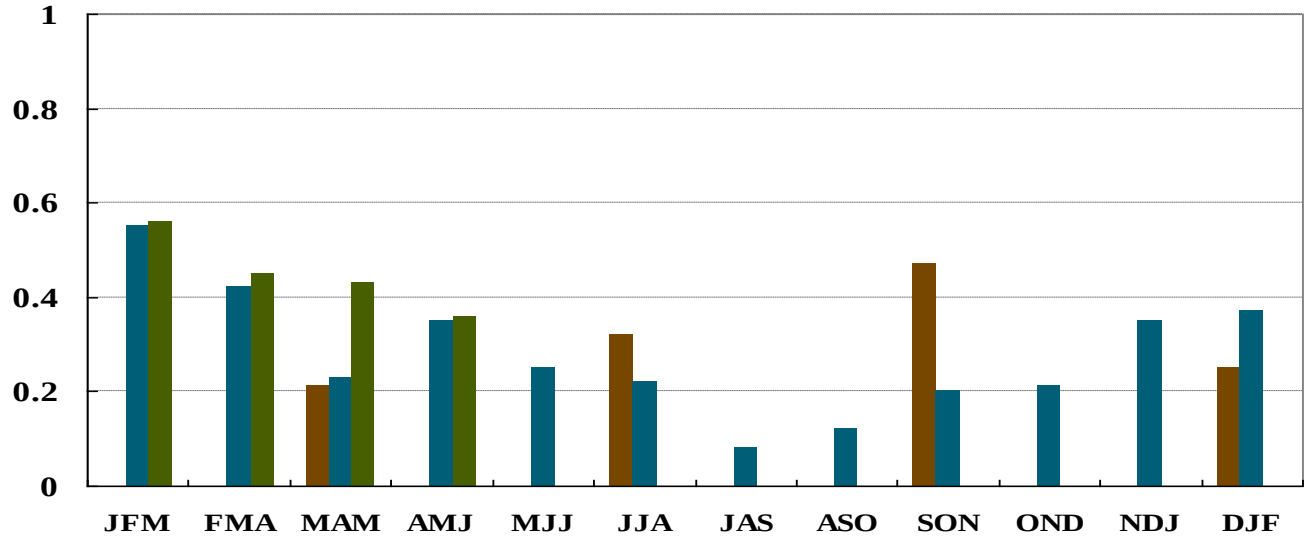

www.apcc21.net

# Anomaly correlation coefficient - gloal

PREC




T850

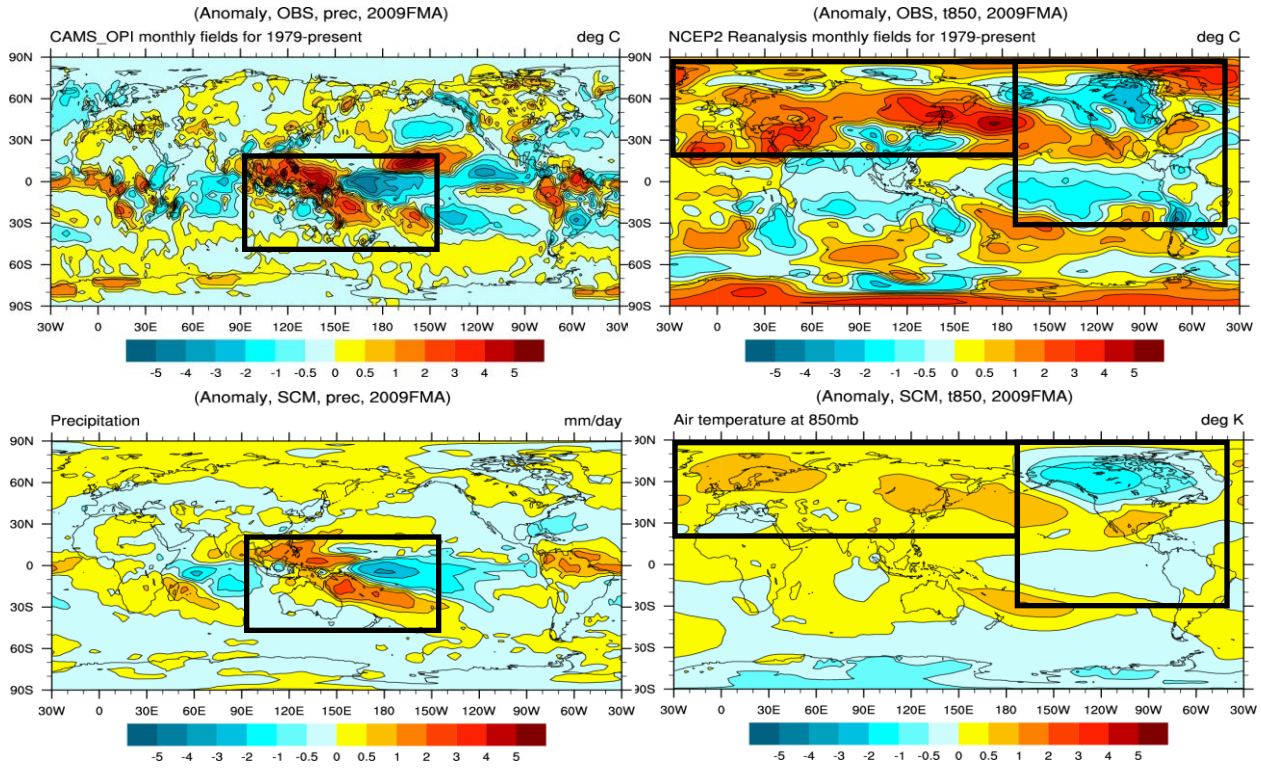


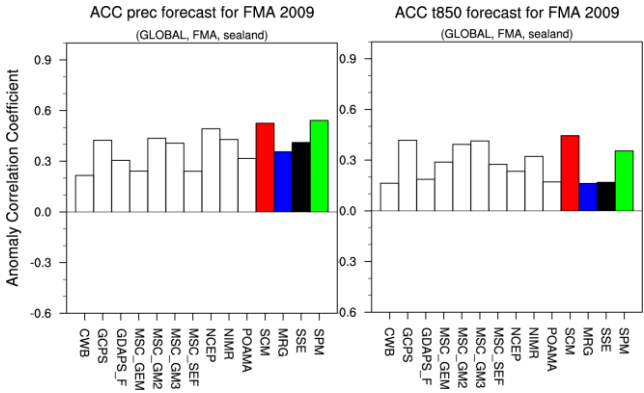

2007

2008

2009

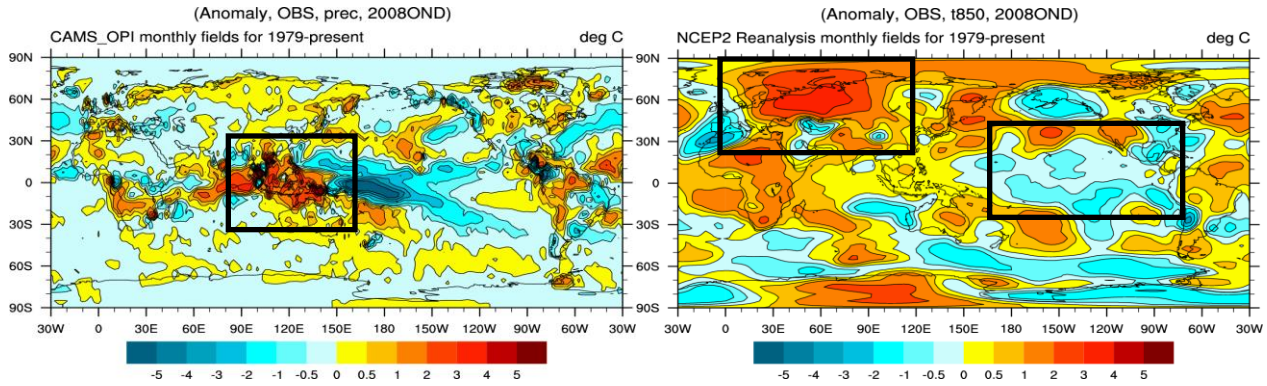
# Best Case: 2009 FMA

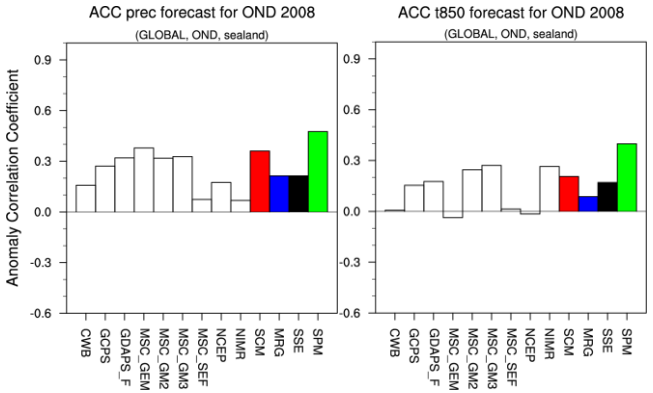



❖ This slide shows the best forecast case. For precipitation, SCM totally hit over the maritime continent and SPCZ showing more than normal rainfall. For temperature, Slightly La Nina event was observed over central and eastern tropical Pacific at observation. SCM also predicted slightly below than normal conditions. Over northern hemisphere, especially Europe and Russia, observation shows positive temperature. SCM also forecasted slightly warm condition at the same region. Additionally, SCM well predicted negative PNA pattern as compared with that of observation.

# Worst Case: 2008 OND




❖ This slide shows the worst forecast case. For precipitation, South Asia including the maritime continent experienced more than normal rainfall at observation. But SCM predicted dry condition. In this case, we totally failed to predict precipitation over South Asia. For temperature, there was slightly La Nina event over central and eastern tropical Pacific at observation. However SCM predicted slightly warm temperature over the same area. Warm condition was shown over Eurasia continent at observation. However, SCM forecasted slightly below than normal temperature at the same region.

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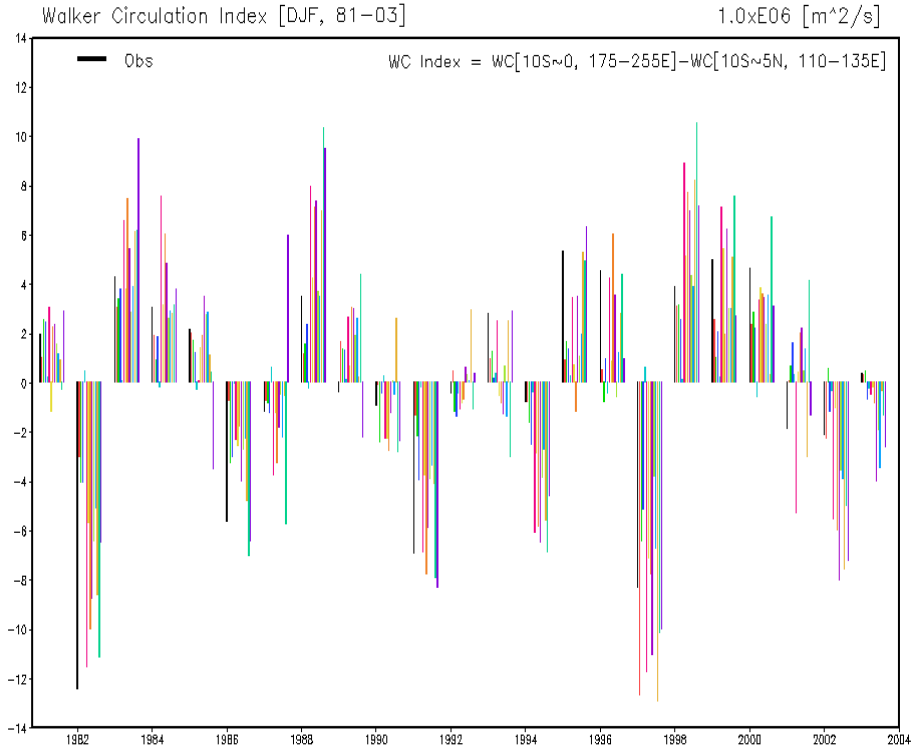
# Monitoring model performance – example

## ENSO-related Walker circulation index (EWCI)




$$EWCI = [WC]_E - [WC]_W$$

The square bracket with a subscript represents the area-mean Walker circulation, averaged over one of the two regions specified as the eastern (E: 10°S-0°, 175°E-105°W) and western (W: 10°S-5°N, 110°-135°E). The choice of using the two regions to define the EWCI is based on the correlation analysis with Nino 3.4 index during the period of 1981-2003.

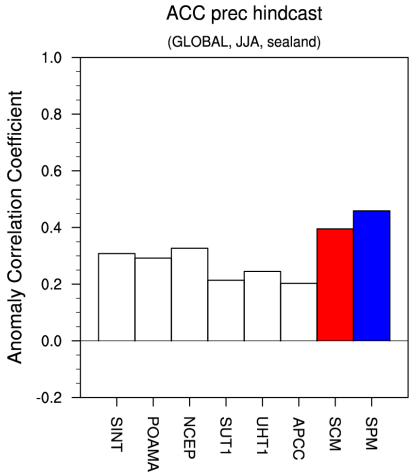
**Figure: ENSO-related Walker circulation index for DJF season during the period of 1981-2003. Black bars indicate the EWCI of observation, color bars indicate that of the individual models.**

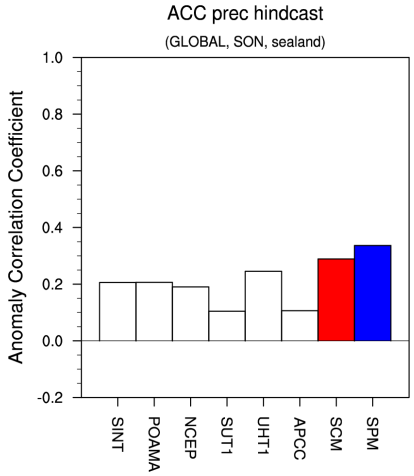
- **Future extention to cyclone, Ex-cyclone activity, monsoon, MJO …**

# Testbed for extreme climate events prediction

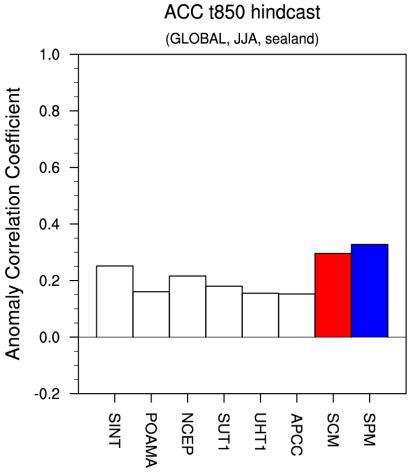
- **Experimental 6-M coupled-model MME**

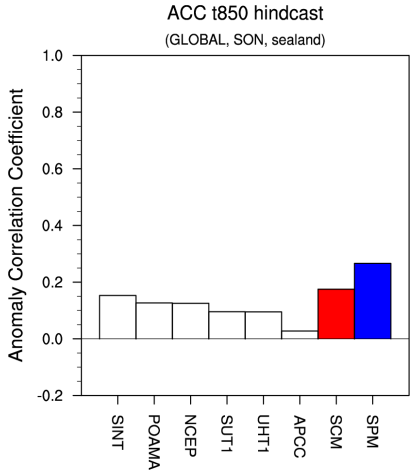
**Prec**



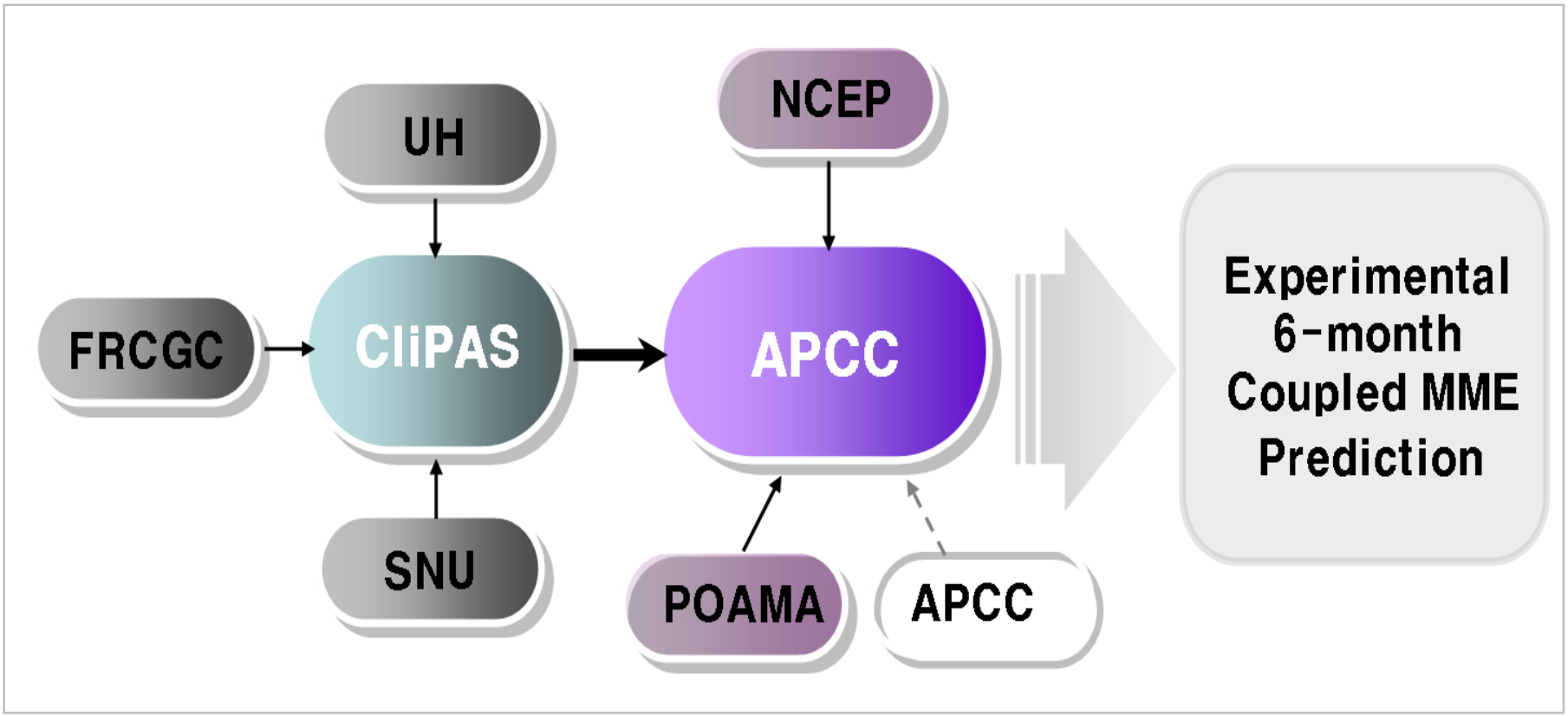

**T850**




- **Future extention to ISO, tropical cyclone …**

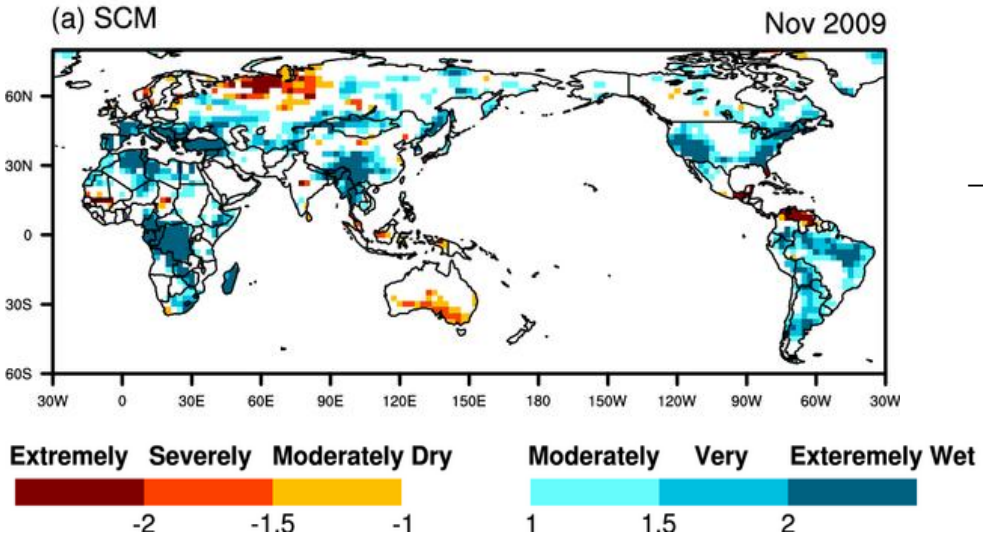
# Potential Application of Coupled Models




- **Diagnosis of various climate indices in real-time basis**
  - Monsoon and Indian Ocean Dipole
  - Rainfall and Drought Index
  - ISV index (MJO)
- **Interpretation for extreme climate events**
  - Application Dyn./Stat. MME downscaling
  - Analysis of daily output

# Supporting Emergency Preparedness: global hydrological extreme forecast

- **Experimental monthly 3-month experimental drought/flood prediction is been carried out since January, 2009.**
- **7-month lead drought/flood prediction is been carried out since January, 2009**




**Forecast: global hydrological extremes based on 6-month SPI**

**From a 6-month time scale (hydrologic)* view**

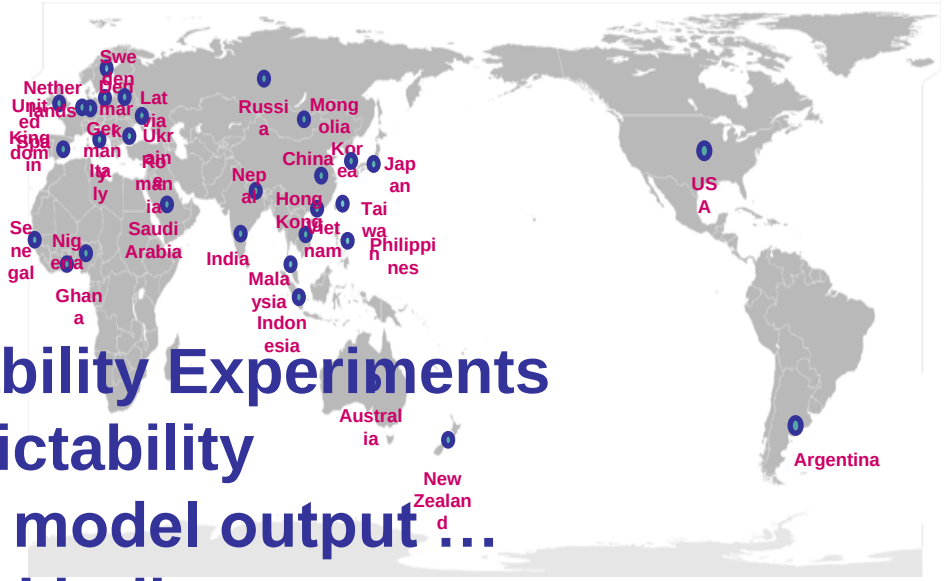
**→ prediction indicates that most of inlands around the globe are likely to very wet conditions, while maritime continent, southern Australia, equatorial Latin America, and northern Europe may experience drought condition.**

- **A global hydrological extreme drought/flood monitoring service has been launched since January 2009 (http://www.apcc21.net/climate/climate03_11.php)**

# Sharing model data

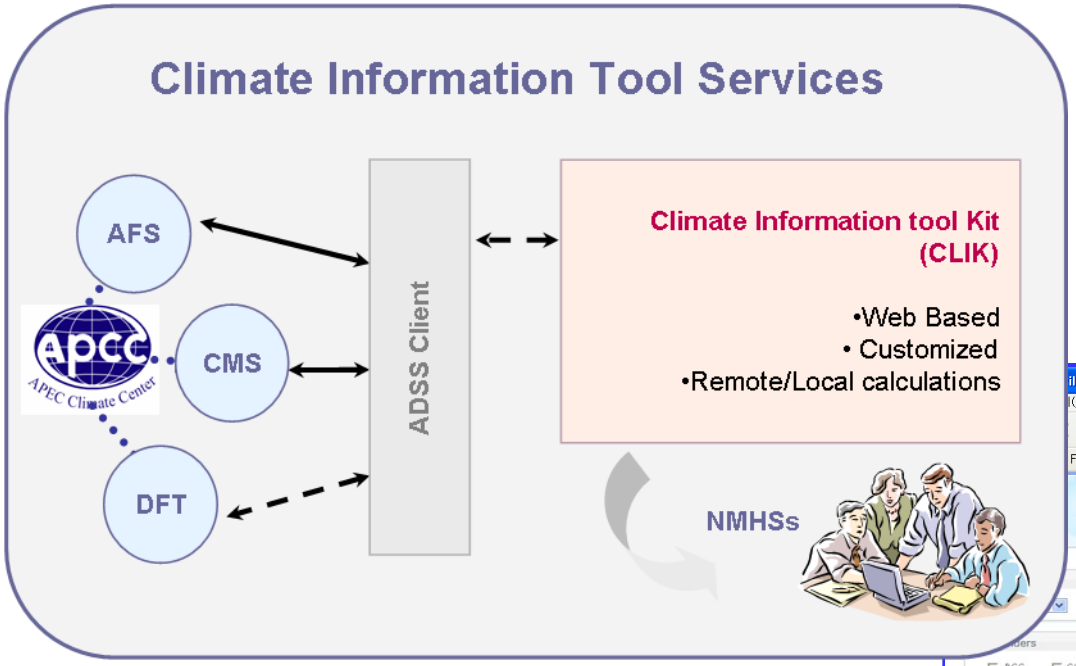
- APCC service to redistribute the data
  - Web based openDAP/http/ftp service
  - Climate Information Tool Kit
  - Command line client, DEX

- Support of Climate Historical Forecast Project (CHFP)
  - APCC participates CHFP as a distributed data center

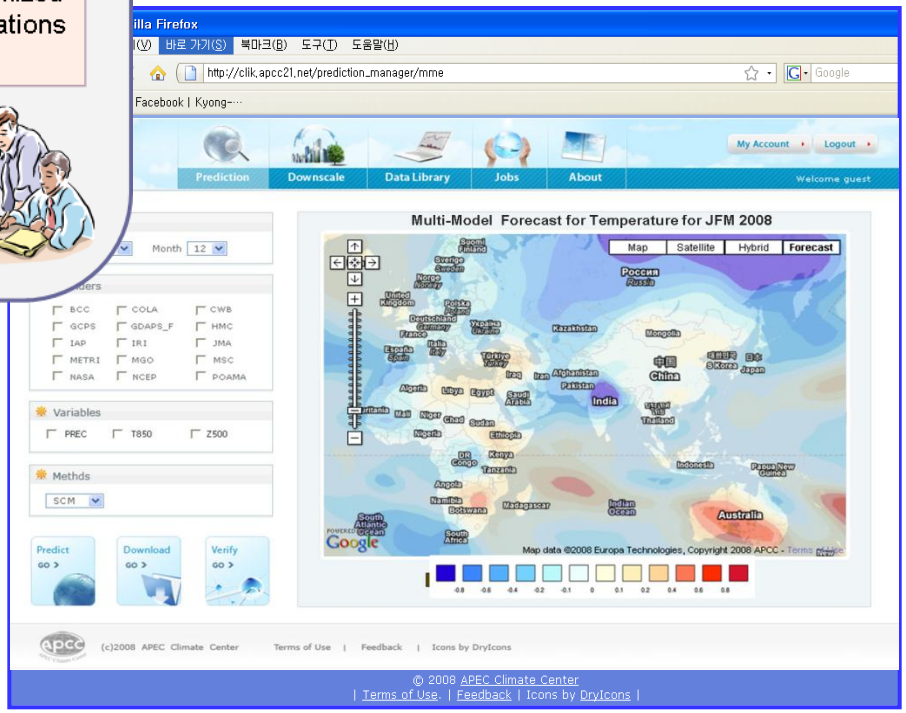



- Future extention to:
  - Extreme Event Predictability Experiments
  - Long lead and ISV predictability
  - High-resolution climate model output …
  - Observation and derived indices …

# Online Tool and Technology Support

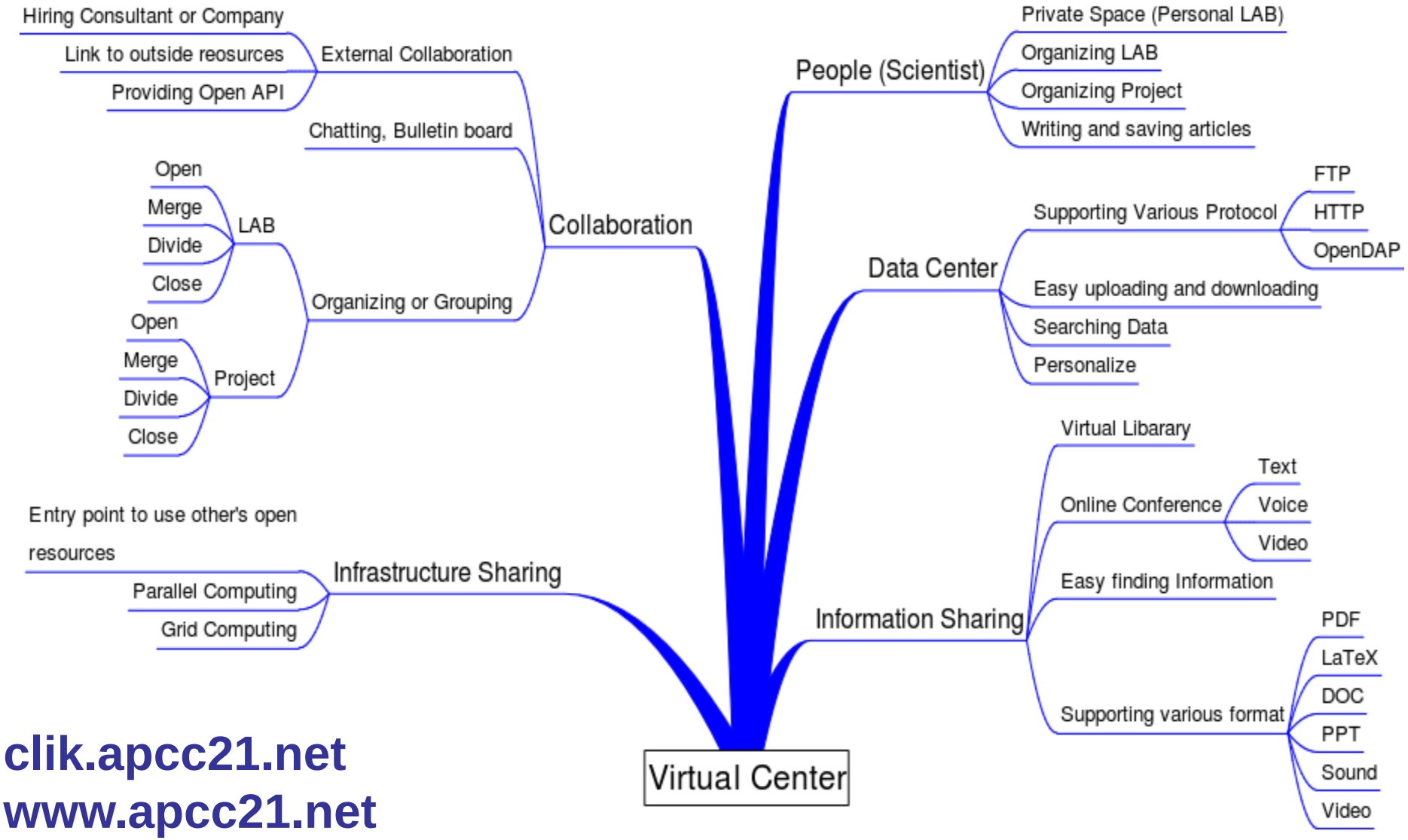



**http://clik.apcc21.net**




*** AFS : Automated Forecast System/ CMS : Climate Monitoring System/ DFT: Downscale Forecast Tool**

# Facilitating information flow to users




**clik.apcc21.net**
**www.apcc21.net**

# Opportunity for research and capacity building

International Conference Hall
90 seats

Five seminar Rooms

APCC Busan office

Share computing resources
( 1Peta flops)

Intl. Symposium,
Workshop, ...

MME
Climate Forecast

Statistical
Downscaling

Extreme
Climate Prediction

Climate Change


Thank You